

WHAT IS CLAIMED IS:

1. A computer system comprising:
a plurality of shelves, each shelf having a carrier for removably receiving a
5 plurality of information processing modules and a switching module, and an
interconnection member for providing connections between the information
processing modules and the switching module;
wherein the shelves are logically connected into a plurality of stacks, the
switching modules of the respective shelves in each stack being interconnected in a
10 logical stacking configuration;
the computer system further comprising a shelf having a carrier for removably
receiving a master switching module, wherein the master switching module is
connected into each stack as a common master switch for all of the stacks.
- 15 2. The computer system of claim 1, wherein the logical stacking configuration is
a closed loop stacking configuration.
3. The computer system of claim 1, wherein each switching module other than
the master switching module is operable as a slave switching module responsive to
20 the masters witching module.
4. The computer system of claim 3, wherein the interconnected switching
modules and master switching module are operable as a single distributed switch.
- 25 5. The computer system of claim 1, wherein the master switching module
provides a single ingress/egress point for data transfer to/from the computer system.
6. The computer system of claim 1, wherein the information processing modules
of each shelf are located at a first side of the interconnections member and the
30 switching module is located at the second side of the interconnections member and

wherein a power supply module for providing power to the modules is removably received in the shelf located at the second side of the interconnections member.

7. The computer system of claim 1, wherein the shelf of the master switching
5 module has no information processing modules and has a power supply module for providing power to the master switching.

8. The computer system of claim 7, wherein the master switching module is
located at a first side of the interconnections member and the power supply module is
10 located at a second side of the interconnections member.

9. The computer system of claim 1, wherein each shelf has a service processing
module removably received therein for providing shelf level service functions to the
modules of the shelf.

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10. The computer system of claim 9, wherein the switching module comprises the
service processing module for each shelf.

11. The computer system of claim 9, wherein the master switching module
20 comprises the service processing module for its shelf.

12. The computer system of claim 1, wherein each shelf comprises two switching
modules removably received therein.

25 13. The computer system of claim 11, wherein both switching modules of each
shelf are connected into a common logical stacking arrangement.

14. The computer system of claim 12, wherein each switching module of each
shelf is connected into a different logical stacking arrangement to the other switching
30 module of that shelf.

15. The computer system of claim 14, wherein each shelf is connected into two logical stacking arrangements, each switching module of the shelf being connected into a different one of the logical stacking arrangements, and wherein the each logical
5 stacking arrangements provides equivalent connectivity between the shelves as the other logical stacking arrangement.

16. The computer system of claim 12, wherein each switching module of a given shelf is operable to replicate the functionality of the other switching module of that
10 shelf.

17. The computer system of claim 12, wherein one switching module of each shelf is operable as a shelf level master switching module and wherein the other switching module of that shelf is operable as a shelf level slave switching module.
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18. The computer system of claim 12, wherein each switching module of a given shelf is interconnected with the other switching module of that shelf.

19. The computer system of claim 18, wherein the inter-switching module
20 interconnection is made through the interconnections member of the shelf.

20. The computer system of claim 12, wherein the shelf having the master switching module has a second master switching module.

21. The computer system of claim 20, as dependent from at least claim 14, wherein each master switching module is connected into a separate one of the logical stacking arrangements.
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22. The computer system of claim 20, wherein each master switching module is
30 interconnected with the other master switching module.

23. The computer system of claim 22, wherein the inter-master switching module interconnection is made through the interconnections member of the shelf.
- 5 24. The computer system of claim 20, wherein the two master switching are operable in master-slave relationship relative one another.
25. The computer system of claim 1, wherein each switching module comprises at least one forwarding element for performing a forwarding operating and a respective
10 controlling element for controlling the switching element.
26. The computer system of claim 25, wherein each switching module comprises at least one switch fabric chip and a controlling microprocessor, and wherein the functionality of each forwarding element is performed by a switch fabric chip and the
15 functionality of the controlling element is performed by the same switch fabric chip and the controlling microprocessor in combination.
27. The computer system of claim 25, wherein each controlling element is aware of the topography of the stack.
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28. The computer system of claim 27, wherein each controlling element is operable to control the operation of the forwarding element to cause a unicast data element to be forwarded by its respective forwarding element using a shortest transmission path to its target.
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29. The computer system of claim 27, wherein each controlling element is operable to control the operation of the forwarding element to cause a multicast or broadcast data element to be forwarded once around the stack in a given direction.

30. The computer system of claim 25, wherein each switching module is content aware.
31. The computer system of claim 30, wherein the controlling element is operable
5 to study a transmitted data element to determine a path to destination based on the content of that data element.
32. A computer system comprising:
a plurality of shelves, each shelf having carrier means for removably receiving
10 a plurality of information processing means modules and a switching means module, and an interconnection means for providing connections between the information processing means modules and the switching means module;
wherein the shelves are logically connected into a plurality of stacks, the switching means modules of the respective shelves in each stack being interconnected
15 in a logical stacking configuration;
the computer system further comprising a shelf having carrier means for removably receiving a master switching means module, wherein the master switching means module is connected into each stack as a common master switch for all of the stacks.
- 20 33. A computer system comprising:
a plurality of modular computer systems connected in a logical stacking configuration;
a second plurality of modular computer systems connected in a logical
25 stacking configuration; and
an aggregation switch connected into the stacking configuration of each of the first and second pluralities of modular computer systems.
34. The computer system of claim 33, wherein aggregation switch is operable to
30 function as a master in each stack into which it is connected.

35. The computer system of claim 33, wherein the aggregation switch comprises at least one communications port for communicating with a computing environment external to the computer system.
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36. The computer system of claim 35, wherein the external computing environment comprises at least one of the internet and an intranet.
37. The computer system of claim 33, wherein a second aggregation switch is provided, connected into the stacking configuration of each of the first and second pluralities of modular computer systems.
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38. The computer system of claim 37, wherein each of the aggregation switches comprises at least one communications port for communicating with the other aggregation switch.
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39. The computer system of claim 37, wherein each plurality of computer systems is connected in two logical stacking arrangements of that plurality of computer systems.
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40. The computer system of claim 39, wherein one aggregation switch is connected into one of the logical stacking arrangements of each plurality of modular computer systems, and wherein the other aggregation switch is connected into the other of the logical stacking arrangement of each plurality of modular computer systems.
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